



# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2005/001180

International filing date (day/month/year)  
21.01.2005

Priority date (day/month/year)  
22.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H01G9/20, H01L31/04, H01L31/18

Applicant  
SHOWA DENKO K.K.

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

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**WRITTEN OPINION OF THE  
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International application No.  
PCT/JP2005/001180

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2005/001180

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	4,5,7,26,30,34-40
	No: Claims	1,2,3,6,8-25,27-29,31-33,41-68
Inventive step (IS)	Yes: Claims	
	No: Claims	1-68
Industrial applicability (IA)	Yes: Claims	1-68
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP2005/001180

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1) Reference is made to the following document:

D1: EP-A-1 363 348 (SHOWA DENKO K.K) 19 November 2003 (2003-11-19)

2) The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claims 1, 9, 33, 41, 43, 47, 50, 64 and 66 are not new in the sense of Article 33(2) PCT.

a) Document D1 discloses (see D1, example 1 and 8, claims 1, 7, 9, 10 and 13) a metal oxide dispersion comprising metal oxide particles ( $\text{TiO}_2$ , obtained by high temperature oxidation of titanium tetrachloride) and a solvent. It is known from the man skilled in the art (and mentioned in the present application, page 19, lines 18-25) that  $\text{TiO}_2$  particles obtained by high temperature oxidation of titanium tetrachloride will form aggregates of interconnected particles (mentioned in the application as necking structures), therefore document D1 discloses a metal oxide dispersion comprising metal oxide particles with a necking structure in a solvent, which is the subject-matter of independent claim 1.

The technical feature corresponding to the suspension droplet contact angle on an ITO surface has been omitted in assessing the novelty of claim 1 because it is a result to be achieved: it depends on the solvent used and on the concentration of particles. This technical feature is therefore not clearly defined. It is noted however, that taking into consideration this technical feature would have resulted in a non unity objection (independent claims 1 and 9 would form a non-unitary claim set).

Therefore, in regard of document D1 the subject-matter of claim 1 is not new and this claim is not allowable (Article 33 (1), (2) PCT).

b) Document D1 (see D1, examples 8, 9, and claims 1, 7, 9, 16 and 17) also discloses the subject-matter of independent claim 9. From the claims 14-21 of the present application it appears that the metal oxide particles from groups F and G are obtained respectively by high temperature oxidation and hydrolysis of an aqueous solution.

Document D1 (see D1, example 9) discloses a suspension of a mixture of particles obtained by the two above mentioned methods and with similar parameters. The necking

properties of the particles obtained by these two methods will be similar to the necking properties of the group F and G particles, therefore the subject-matter of independent claim 9 is also disclosed by document D1 and is not new (Article 33 (1), (2) PCT).

c) Document D1 also discloses the subject-matter of independent claims 31, 33, 41, 43, 47, 50, 64 and 66 which are therefore not new (Article 33 (1), (2) PCT).

3) Dependent claims 2-8, 10-32, 34-40, 42, 44-46, 48, 49, 51-63, 65, 67, 68 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, see document D1.

4) It is noted, that if the claims referring to the use of the metal oxide dispersion (claims 33-42 and 64-65) or the claims referring to a metal oxide film, electrode or article comprising such film or electrode made using the dispersion (claims 43-63 and 66-68), was considered new and inventive, the application would lack unity.

5) all claims fulfil the PCT requirements regarding industrial applicability.

### **Re Item VIII**

#### **Certain observations on the international application**

Claims 1, 9, 11, 31, 47, 50, 62 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined.

a) The claims 1, 11, 31, 47, 50, 62 attempt to define the subject-matter in terms of the result to be achieved: droplet contact angle with an ITO surface (claim 1), distribution constant according to the Rosin-Rammler formula (claim 11), properties of the nyquist plot and values for the impedance of a film (claims 31 and 47), or the scratch strength of a film (claims 50 and 62) which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
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International application No.

PCT/JP2005/001180

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b) The subject-matter of claim 9 defines properties of metal oxide particles by their necking structure, which is not a property commonly used in the field to characterise the metal oxide particles, and therefore render the comparison with available prior art difficult. In the present case, it seems more appropriate to defines the properties of metal oxide particles by the method which permit to fabricate them.